



Dirt Dialogues – An Exercise in Transdisciplinary Integration

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A poster exhibition of artists' works and a film program was realized from June 8 to June 13, 2014 at the 20th World Congress of Soil Science, (20WCSS) in Jeju, Korea as an empirical exercise in transdisciplinary integration. By integrating the arts into one of the largest and most prominent scientific conferences on soils, the aim was to bring different areas of expertise together to inspire new opportunities for sci-art collaboration, and to expand the horizons of soil protection and communication. The scientific poster session served as a site of communication that was logistically, conceptually, and visually well situated for the integration of a broad range of artworks with and about soil, while a makeshift cinema served to deepen aesthetic and emotional experience in an immersive, atypical conference gathering space. Images and descriptions of selected projects as well as a complete list of participating artists and scientific session topics is documented on www.soilarts.org.



1. Introduction: Integrated Art and Film Program at the 20th World Congress of Soil Science

From June 8 to June 13, 2014 I co-curated a poster exhibition of artists' works and a film program at the 20th World Congress of Soil Science, (20WCSS) in Jeju, Korea with Prof. Dr. Gerd Wessolek, chair of the Department for Soil Protection, Institute for Ecology at the Technische Universität Berlin. By integrating the arts into one of the largest and most prominent scientific conferences on soils, the goal was to bring different areas of expertise together to inspire new opportunities for transdisciplinary collaboration, and to expand the horizons of soil protection and communication. The project was made possible with generous support from the International Union of Soil Sciences, travel funding from the DAAD, and preliminary research funding from the Andrea von Braun Foundation.

The art and film program at the 20WCSS represents a practical component of my PhD dissertation on Soil and Art as well as an empirical exercise in transdisciplinary integration. Integration has been described as a fundamental part of transdisciplinary research and collaboration processes that occurs in multiple phases using different methods (Bergmann & Schramm, 2008). Pohl et al. (2008) identify four fundamental principles of integration that we considered instrumental in the development and realization of the integrated arts program at the 20WCSS. These are: mutual understanding based on linguistic exchange between collaborating partners; theoretical concepts covering a spectrum of quantitative and qualitative approaches and discrete disciplines; models used to project scenarios and aid in decision-making; and products including technical devices, data sets, regulatory policies, medical treatments, exhibitions, and urban development plans (Pohl et al., 2008: 415-417).

We adopted these four principles in our curatorial work at the 20th WCSS at the 20th WCSS in the following ways. The art exhibition used a common presentational format of printed posters to encourage mutual understanding via a common visual language. Theoretical concepts, such as food security and anthropogenic change, were used as a common point of departure to link individual artistic contributions with specific corresponding scientific conference sessions. The project was used as a model for future transdisciplinary research, now being carried out as a book publication with the Soil Science Society of America that pairs participating artists with scientists and decision makers from around the world to discuss soil issues across disciplinary boundaries. Finally, the development of the project was understood as an actual product – an art exhibition and film program that could be viewed and discussed. In the following paper, I will introduce main background concepts, highlight a few examples from both parts of the program, and draw some initial conclusions on the practical and theoretical implications of such a program as well as opportunities for future development.



2. Appropriating Form, Expanding Content: The Poster Session as Format for Integration

The World Congress of Soil Science (WCSS) is a formal meeting of the International Union of Soil Sciences (IUSS) and associated soil science, agricultural, and geophysical societies from around the world. It occurs every four years in a different host country, and like other scientific congresses, could be described as a platform for communication, or „an event at which new and current research is reported and discussed in an atmosphere that encourages spontaneous generation of ideas and communication“ (Oseman, 1989: p3). In his survey of the history, values, and functions of scientific conferences, Oseman summarizes the main functions of scientific conferences laid out by King in 1961 as: „1) announcement of new knowledge; 2) exchange of information and experience; 3) education; 4) formulation of problems and situations in interdisciplinary areas; 5) fact-finding and reporting; 6) negotiation and policy formation; (and) 7) status and ceremonial“ (Oseman, 1989: 4).

Beyond changes in conference operation and accessibility due to increased mobility, and online organization and documentation, the basic functions of scientific conferences have by and large remained the same. The inclusion of art at scientific conferences points to a social, celebratory, or „ceremonial function“ in King’s terms, but also a more practical, economic one. Artistic events, such as concerts, exhibitions, and excursions, are often offered as extra „social events“ that give the conference an added overall value and function to attract potential conference guests. Examples of art as ceremonial, social, or added-value offerings at soil science conferences may be found in at least the last two world congresses as well as annual conferences hosted by the German Soil Science Society, the Soil Science Society of America, and the Australian Soil Science Society.

The presence of artists at scientific conferences beyond the fulfillment of celebratory, social, and ceremonial functions is a much more seldom phenomenon, as their inclusion partly contributes to other conference functions of knowledge transfer, problem formulation, educational development, and transdisciplinary exchange. With a lack of „mutual understanding based on linguistic exchange“ (Pohl et al., 2008), these functions are more difficult to facilitate and communicate across disciplinary boundaries. Except for conferences that are specifically designed and advertised as inter- or transdisciplinary meetings (e.g. the Sustainability Summit at the University of Leuphana, the Atlas T3 conferences of the Academy of Transdisciplinary Learning and Advanced Studies, or the Global Soil Week and Climate Engineering Conferences of the Institute for Advanced Sustainability Studies), the exchange of information and presentation of new research at scientific conferences are generally oriented by and for specific disciplinary groups. As a relatively flexible communication format, the poster session stands out as one area of conference programming that allows for such trans-disciplinary exchange.



Since King's original observations of conference functions over fifty years ago, the poster session has become a permanent convention of scientific communication at conferences across all academic disciplines and sectors (Ruhl, 2011). Oelmann (2011) attributes the rise of scientific posters in the natural sciences as an efficient and cost-effective replacement of earlier demonstrations of live experiments and presentations of innovative equipment and methods at conferences. This is reflected in the majority of poster contributions to national and international soil science conferences, which devote a greater part of the poster design to images and text describing methods and outcomes of specific research projects. Beyond presentation of methodologies, Hoffmann (2011) describes the scientific poster as a synthesis of placard plus project plus position. In other words, the poster is a printed, graphical representation of a research activity that is summarized in terms of a „project” (including its methods and related instruments) and is embedded with the authors' goals, visions, and scientific positions (Hoffmann, 2011:31). Since artists are skilled in graphic representation and tend to work in a project-based manner, we were interested in exploring such a „placard plus project plus position” formula as a common means of communication for both artists and scientists at the 20WCSS.

The result was an exhibition of 36 artists' posters documenting projects that used soil materially or symbolically to address issues of food security, soil degradation, land use manage-



Figure 1. Permanent block of artists' posters in entrance lobby at the 20th World Congress of Soil Science



ment, and more. The visual language of the scientific poster session was appropriated to include artistic methodologies into the given format. When the call for abstracts was sent out by the 20WCSS, we put out a mixed call for poster presentations of art works that were in some way related to specific scientific session topics. For example Berlin and Tokyo based artist, Ayumi Matsuzaka's, performance artwork with Terra Preta was placed in the session on Biochar Soil Amendments, or Dan McCormick and Mary O'Brien's large-scale willow-sculptures to control hillside erosion in the session on Physical Restoration of Soils. A permanent block of artists' posters hung in the 3rd floor lobby (Figure 1) and served as central point for reflection and conversation, while each day seven to nine posters were rotated within different scientific poster sessions located in multiple poster areas.

The focus of the poster exhibition was on artistic experimentation and visual research, rather than simply visualizing the decorative or aesthetic qualities of the soil. Some posters depicted the conceptual development and methods of works in progress in text and photographic documentation. Other posters showed singular or multiple views of resulting artworks. Still others showed participatory processes of artists collaborating with others or members of the public interacting with artworks. By inviting artists to show different stages of their works, akin to scientific posters showing background concepts, methods, and results, we sought to challenge intellectual barriers between art and science by juxtaposing artistic approaches with scientific research. To our knowledge, such an inclusion of artists' posters in a major scientific conference of this nature has never before been realized. Artists regularly contribute posters to arts education conferences and design competitions but not usually to conferences of the natural sciences, such as the 20WCSS. For their willingness to collaborate, we are grateful to 20WCSS organizers as well as all participating artists and art collectives.

Below are a few more examples to give readers a taste of the different artistic positions and practices presented at the exhibition, while Table 1 gives a complete overview of artists featured in individual scientific sessions. Images and descriptions of selected projects can also be found on our research blog, www.soilarts.org.



Table 1 Overview of artists featured in individual scientific sessions

ART PROGRAM: 3F LOBBY AND SELECTED POSTER SESSIONS
<p>Monday, June 9, 2014</p> <p>Margaret Boomer C1.4-1 Marginal Soils</p> <p>Jackie Brookner C1.1-2 Interactions between Soil Structure, Living Organisms and Organic Matter</p> <p>Center for Land Use Interpretation ID54 Critical Issues of Radioisotope Behavior in Soils and Remediation</p> <p>Georg Dietler ID110 Impact of Bioenergy Cropping on Soils and the Environment</p> <p>Heleen Lassoik D57 African Eco-Efficient Solutions to Food Insecurity and Climate Change</p> <p>Myriel Milicevic and Ruttkorn Vuttikorn ID51 Folk Soil Knowledge for Soil Taxonomy and Assessment</p> <p>Bonnie Ora Sterk D56 Soils in the Anthropocene Era: Global Health, Food Security, and Human Health</p>
<p>Tuesday, June 10, 2014</p> <p>Ekkehard Gitzler C1.5-2 Quantification and Application of Uncertainty in Pedometrics</p> <p>Elle moore W66 Urban Soils: Properties, Functions and Evolution</p> <p>Annali Kettner C4.5-1 The Soil Underfoot: Intrinsic Possibilities for a Finite Resource</p> <p>Ajuni Matsuzaka ID55*2 Biochar Soil Amendment for Environmental and Agronomic Benefits I</p> <p>Daniel McCormick & Mary O'Brien C1.5-4 Physical Restoration of Soils</p> <p>Nil By Mouth ID53 Soil Information and Food Security</p> <p>Jay Noller C1.1-1 The Role of Environment on Soil Formation: Morphological Indicators</p> <p>Smudge Studio C1.6-1 Pedoepitology</p> <p>Ken Van Iersel C4.2-1 Linking Forest Management and Soil Processes to Ecosystem Productivity and Functions</p> <p>Elvira Wentsche C1.2-1 Pedodiversity and Ecological Services – Bridging Soil Geography and Land Use</p>
<p>Thursday, June 12, 2014</p> <p>Betty Benar WG10. Cryocolls on a Changing Planet: Properties, Processes, Regimes and Functions</p> <p>Future Farmers C1.2-3 Soil Data, Spatial Information Systems and Interpretation Procedures</p> <p>Sarah Mirreivan C1.4-1 Mineralogy and Reactivity of Soil Minerals</p> <p>Matthias Kauder C1.5-3 Management and Reclamation of Mining Site Soils</p> <p>Nance Kefauver D55 Soil Health: Key to Food Security</p> <p>Maria Michalis C1.1-3 Hydro-Ecological Observatories and Advances in Soil Measurements and Sensors</p> <p>Gero Mottag C1.3-2*2 Life in Soils – Distribution and Function of Soil Microorganisms in a Changing Environment</p> <p>Tatthio Tan C4.4-1 Education and Social Awareness for Soil Science in General Public</p> <p>Urbanahoeve C1.3-2 Advances in Rhizosphere Regulation and Soil Nutrient Management</p> <p>Peter Ward C2.4-3 Minerals as Regulators of Carbon Flow Through Soils</p>
<p>Friday, June 13, 2014</p> <p>Ulrike Arnold W68 Proximal Soil Sensing</p> <p>Ginny Diester C2.2-4 Behavior and Fate of Pesticides Entering the Soil Environment</p> <p>Patrick Lyon & Suhee Yang C4.5-2 Cultural Perspectives on Soils and Soil Science</p> <p>Matthew Moore C1.3-4*2 Soil Management Strategy for Enhancing Crop Yields</p> <p>Laure Parker C2.5-1 Advances in Techniques to Investigate Chemical, Physical and Biological Interfaces in Soils</p> <p>Aviva Rahmani C1.4-1 Design and Performance of Cover Systems for Landfills and Contaminated Sites</p> <p>Alexandra Roland WG11 Progress in Digital Soil Mapping and GlobalSoilMap</p> <p>Urbanahoeve C1.3-4*2 Soil Management Strategy for Enhancing Crop Yields</p> <p>Gerd Wessels WG11 Soil Information Exchange Standards and Systems</p>



2.1 Selected Poster Contributions

Sarah Hirneisen – *Minerology and Reactivity of Soil Microsites*

When soil scientists talk about the reactivity of the soil, they usually refer to the availability of nutrients or mobility of pollutants based on pH measures, precipitation levels, and organic content. We invited Sarah Hirneisen to present a few of her projects casting soils in glass in the session C2.4-1, Minerology and Reactivity of Soil Microsites. This placement was based on Hirneisen's artistic methods as well as her unique relationship to soil materials. Hirneisen reframes „soil reactivity” in terms of how different soils will react in the glass kiln. She has collected the cremated ashes of people's personal belongings, dust from vacuum cleaners, contaminated soil from Superfund sites, soil samples people have collected for her in their travels, and soil donated by soldiers in Afghanistan and Iraq. The artist shows how these materials are not only physically and chemically reactive but also symbolically and culturally reactive. In her poster text, the artist explains the origins of her process:

„I began collecting soil as a way to document the places I have lived. For me it became a record of my life and experiences, almost like keeping a diary. I discovered that I could fuse (heat) two layers of glass together with soil trapped between and not only did the soil become pressed forever, but the heat caused interesting reactions between the soil and glass. Some of the glass panels would bubble up while other times the soil might change colors. I began seeking out specific soil, such as samples from contaminated sites in California (called CalSites) or from everyone in my address book...” (Hirneisen, 2014)

Center for Land Use Interpretation (CLUI) – *Critical Issues of Radionuclide Behavior in Soils*

For the Session IDS4, Critical Issues of Radionuclide Behavior in Soils and Remediation, The Center for Land Use Interpretation (CLUI), led by multimedia artist Matthew Coolidge presented a project spearheaded by photographer Aurora Tang called Perpetual Architecture: Uranium Disposal Cells of the American Southwest (2012). This project visualizes the disposal cells, sometimes up to half a square mile in size, that contain the remains of uranium mill buildings and tailings, constructed to limit contact with their surroundings for a thousand years. These unintended „land art” monuments resemble pyramids or relics from a geometrical mound-building culture that are built to minimize erosion and other potential threats to their stability, but exist as surface features that are at some level open to atmospheric forces and will one day erode like any other monument (CLUI, 2012). For this session, it was important to call attention to the human behavior behind „radionuclide behavior in soils,” as these are intrinsically linked. In the supplementary poster text, CLUI states its motivation for pursuing such a topic, in that it is:



„...interested in understanding the nature and extent of human interaction with the earth’s surface, and in finding new meanings in the intentional and incidental forms that we individually and collectively create. We believe that the manmade landscape is a cultural inscription that can be read to better understand who we are, and what we are doing.” (CLUI, 2014)

Daro Montag – *Life in Soils – Distribution and Function of Soil Microorganisms*

For the Session C2.3-2*2, Life in Soils – Distribution and Function of Soil Microorganisms in a Changing Environment, Daro Montag contributed Bioglyph images from the project, This Earth (2007). Combining knowledge of photography and soil biology, the UK-based artist and director of the Research on Art, Nature & Environment Program (RANE) at Falmouth University creates snapshots of the earth not with a camera, but with the soil itself. Rather than photographing the soil, Montag allows soil microorganisms to eat away the gelatin surface of film strips laid directly on the soil, resulting in brilliantly colored records of microbial action in the soil, which vary according to depth, pH value, bulk density, and moisture content. Montag’s methods have been adopted by other artists as a way of visualizing the soil biome. It is his hope that though transdisciplinary collaboration with scientists, such techniques may find value for the soil scientific community as well. In his poster text, Montag describes his process:

„Cores were taken by digging a hole one meter deep and extracting the soil carefully with a shovel. This was then preserved in a wooden box. Five prepared films were encased in the boxes with the soil cores and left for four weeks. After this period the films were extracted, dried and viewed on a microscope. Photographs of small sections of the film were made, each with a diameter of approximately 2mm. The resulting art project, This Earth, comprises five strips of buried film on a lightbox, and ten framed digital prints. The work is exhibited along with soil samples, the tools used to create the work, and the scientific analysis of the soil samples.” (Montag, 2014)

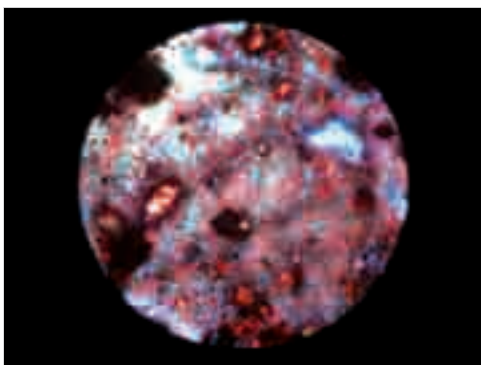


Figure 2. Daro Montag: *This Earth*, 2007



Figure 3. Matthew Moore: *Moore Estates*. 2005



Matthew Moore – *Soil Management Strategies for Enhancing Crop Yields*

Several artists in both the film and art poster parts of the program focused on agricultural issues. For the session C3.3-4.2, Soil Management Strategies for Enhancing Crop Yields, Matthew Moore presented Moore Estates (2005), a project he created on his family farmland outside of Phoenix, AZ that looks at yield as a fundamental value of the American dream. Using large-scale, geometric conventions of land art, Moore created an earthwork that visualizes the fate of his family's land and questions the politics of soil protection in the United States, where valuable farmland is often sold to speculating developers. In an age of ever growing urbanization, „soil management strategies for enhancing crop yields“ are forced to go beyond traditional crop science research on plant-soil interactions to address land-use zoning and sustainable regional development. Moore draws on his family history in the design and realization of Moore Estates, comparing in visual and very literal terms the value of food to that of shelter. Moore explains his process:

„In 2004, my grandfather sold the first portion of our family's land to a developer for a 253 home suburban community. The design is a scaled replica of the planned lot map that was submitted by the developers to the city of Surprise, AZ. The site for the earthwork was chosen in its relation to the actual building area of the development. I mapped it out at a third scale using a CAD program and a GPS surveying crew. The 253 homes were planted in Sorghum, and the roads are seeded wheat“ (Moore, 2014)

Jackie Brookner – *Interactions between Soil Structure, Organisms, and Organic Matter*

The Session, Interactions between Soil Structure, Organisms, and Organic Matter featured recent research on humus, or the upper layer of the soil consisting of decomposing organic matter in various stages and forms. Contributions ranged from papers on soil structure to the dynamics of different soil organisms such as Pleurotus ostreatus mushrooms, desert varnish microbes, earthworms, and termites. For this session, we invited Jackie Brookner to present one of her latest plant-based water remediation „sculptures,“ The Fargo Project, to emphasize how humans are the most active organism in the humus-sphere. Brookner (1999) has argued that humanity, humility, homage and humus are all semantically and symbolically related. „Hidden in the roots of these words we find what we seem to want to forget – that we are literally the same stuff as earth. The Indo-European root of homo, as in homo sapiens, means ground or earth.“ It is in this inherent connectedness that the human being becomes a key player in the organic lifecycles of the soil. With extensive walking trails, gathering areas, and native meadows, the storm-water-basin-as-art-park takes this philosophy as point of departure to transform an 18-acre storm water basin into a beautiful and multifunctional space for residents of all species. For Brookner, the „Interactions between Soil Structure,



Organisms, and Organic Matter” is a matter of ecological aesthetics, community engagement, and urban planning all rolled into one. The long-term goal of the project, Brookner writes,

„is to transform many of Fargo’s storm water basins into a network of restored prairie and prairie wetlands, and to do this through participatory community process. Water quality, soils, flood control, biodiversity, cultural diversity, and human health and well being will become the beneficiaries of recognizing storm water as a valuable resource.” (Brookner, 2014)

3. Soil & Cinema

The second part of our arts program at the 20WCSS consisted of a film-screening program of twenty-five short and feature length films that took place in a large dark meeting room during lunch and coffee breaks over the four days of the conference. With works by award-winning documentary filmmakers, media artists, soil scientists, and NGOs, the program brought together narratives of soil stewardship from around the world, presenting different perspectives on agriculture, resource extraction, desertification, and soil fieldwork. In contrast to the integration of artists’ works into the poster session, the film program deviated from the formal conference conventions of neat rows of posters and tightly orchestrated PowerPoint presentations. Rather, it provided a space within the conference space to retreat into another world of emotional and aesthetic experience through moving images and sound. The dark meeting room was almost always full.

Adrian Ivakhiv argues that „moving images move us... They engage us in the movement of the storyline, the actions and reactions unfolding in and through and around the places and characters portrayed, and immerse us in the flow of sensation felt or imagined in the viewing: the movement, sound, words, and bodily gestures as these are perceived and interpreted by us from the experienced sound-images (Ivakhiv, 2013: 93). By introducing an immersive space of sensation and imagination at the 20WCSS, different soil topics were taken out of the objective and calculated context of scientific research and recontextualized as emotionally charged, real world issues with human storylines. Individual stories of agricultural life, climate change, and desertification were thus juxtaposed with statistical models and digital maps presented elsewhere at the congress.

Cinema is an extraordinarily effective instrument for communicating environmental issues and generating scientific debate within the general public. On the subject of climate change and ecocinema, Stephen Rust (2013: 205) writes, „if these films make anything clear, it is that more and more people are becoming aware that new ways of imagining the relationship between people and the planet are not only possible, but necessary.” Awareness about global warming, for example, has been linked to the viewing of catastrophe films such as Roland



Emmerich's (2004) *The Day After Tomorrow* (Norton & Leaman, 2004). And behavioral change has been attributed to the viewing of climate change films, such as the localized increase in carbon offset purchases after the release of *An Inconvenient Truth* in 2006 at theatres across the United States (Jacobsen, 2011).

What *The Day After Tomorrow* and *An Inconvenient Truth* have achieved in terms of public awareness of climate change, can be compared to a handful of films focusing on soil protection topics. From the deserted expanses of Pare Lorenz's documentary, *The Plow that Broke the Plains* (1936) to the shadowy figures of John Ford's award winning drama, *The Grapes of Wrath* (1940), visions of the unregulated farming practices that led to the great Dust Bowl and subsequent soil protection reform served to anchor soil degradation in American history. Ed Landa, who has described the placement and symbolism of soil in Hollywood movies such as David Lynch's *Dune* (1984), Bram Stoker's *Dracula* (1992), and the Coen Brothers' *The Man Who Wasn't There* (2001), argues that „because of their scenic dimensions and their association with place and the cultures inhabiting these places, soils are a conscious component of many films” (Landa, 2010: 103).

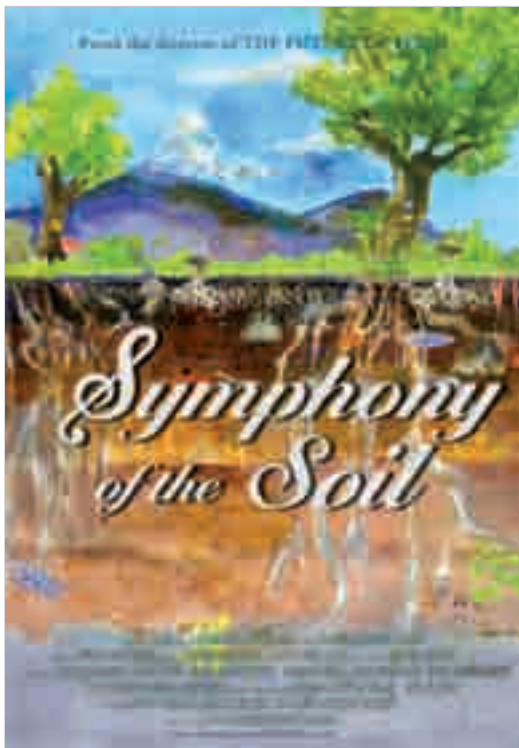


Figure 4. Film poster for *Symphony of the Soil* (2012)

More recently, a wave of documentary films focusing on agriculture and social justice issues have helped solidify arguments against industrial agriculture and exploitive extraction in popular culture. From the shocking scale of Peter Mettler's aerial shots of the Alberta Tar Sands in *Petroplouis* (2009) to the delicate watercolor animations of Deborah Koons Garcia's *Symphony of the Soil* (2012; Figure 4), distinct imagery of soil conservation issues has reached the imaginations of audiences worldwide by way of the silver screen. Beyond raising awareness, these examples use cinema as a platform for change and call to action. Rust and Monami argue that the potential to motivate behavioral change is a unique feature of cinema. „Cinematic texts,



with their audio-visual presentations of individuals and their habitats, affect our imaginations of the world around us, and thus, potentially, our actions towards this world” (Rust & Monami, 2013: 2).

Given the communicative power of film as a medium with high cultural capital and popular appeal, soil scientists have also recently turned to the medium of film, video, and animation to disseminate soil information and generate motivation for soil stewardship. This is evident in the Global Soil Partnership’s multi-language release of *Let’s Talk About Soil* (2012), the short public service spots of the Soil Science Society of America’s „I heart soil” media campaign, and the release of educational short films by the Soil Care Inc. of Australia to promote simple knowledge transfer and sustainable farming practice. Building on this use of film media by the scientific community, the program we designed for the 20WCSS served to inspire discussion on different challenges facing diverse regions of the world, alternating promotional videos by soil science backed organizations with narrative documentaries by independent filmmakers and short video works by artists.

Many of the films in our program can be associated with the fields of ecocinema, a relatively new film genre that is still being developed and marketed at green film festivals such as the Environmental Film Festival in Washington D.C., the Planet in Focus festival in Toronto, as well as Green Film Festivals in Korea and the United Kingdom. Salma Monami emphasizes the importance of green film festivals in society in that they „present themselves as meeting spaces for expanding the spheres of democratic and public engagement... These festivals are not simply forums for general entertainment – they are formatted to bring communities together to share a common cause (environmental understandings, however vaguely defined) and to feel ‘inspired’ in community gatherings” (Monami, 2013: 257...263).

Although not a film festival in a moviegoer’s sense of the term, the European Geosciences Union Annual Assembly (EGU) has hosted the GeoCinema for the last five years, offering conference guests a running program created in part by attending researchers, and amateur and professional filmmakers. Inspired by the EGU’s GeoCinema, we used the opportunity of the First Global Soil Week in 2012 to create a pilot soil cinema program at a local movie theatre as a public outreach event to raise awareness about the issues addressed at the conference. The program we created for the 20th WCSS was a further replication of such a „conference festival format,” which we hope to further develop as a model of transdisciplinary integration, on the one hand as a gathering space for conference communities with a shared environmental cause (soil protection), and on the other as a way to open up the research-generated debate of scientific conferences to the broader public. Below is an overview of the four-day program, with descriptions of daily topics and individual contributions.



3.1 Overview of the Film Program

Desertification on Film

The first day featured several „case studies“ on Desertification. The UNCCD (United Nations Convention to Combat Desertification), the only legally binding international agreement on environment, sustainable development and land management, defines desertification as „land degradation in arid, semi-arid and sub-humid areas resulting from various factors, including climatic variations and human activities. When land degradation happens in the world’s drylands, it often creates desert-like conditions. Land degradation occurs everywhere, but is defined as desertification when it occurs in drylands. Behind land degradation lies disturbance of the biological cycles on which life depends, as well as social and development issues“ (UNCCD, 2012). Desertification results in massive loss of vegetation, wildlife, biodiversity, and the retreat of waterways and wetlands, but can be reversed, to some extent by sustainable agricultural practice and ecological sensibility. The phenomenon is an increasing focus of concern and new research for soil scientists and policy makers worldwide.

The „Aralkum“ is considered one of the most famous historical cases in desertification (Breckle et al., 2012). Aral – the Lost Sea, by filmmaker Isabel Coixet (2011), presented the tragic story of the rapid retreat of one of the world’s largest freshwater lakes on account of industrial expansion of cotton fields and the construction of a 500-kilometer long canal system in the former Soviet Union. The once fertile regions of Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan and Kyrgyzstan have suffered enormous human costs as a result of the environmental devastation around the Aral Sea. „The region has the highest infant mortality rates in all of the former Soviet Union. Chronic bronchitis has increased by 3000% and arthritis by 6000%. In the Uzbek region of Karakalpakstan, anemia is epidemic among women and 97% of them have hemoglobin levels lower than the 110 grams per liter of blood... liver cancer increased by 200% from 1981 to 1987, throat cancer by 25% and infant mortality by 20%...“ (We Are Water Foundation, 2011). The emotional price of hopelessness and loss in the Aral region are poignantly captured in Coixet’s 25-minute documentary. Narrated by Sir Ben Kingsley, the film alternates between historic images of family beach vacations and lively harbor scenes and current glimpses of cracked, salt-caked soil and ghostly, corroded ships abandoned in a man-made expansive desert.

A second film focused on another region severely threatened by desertification. When the Water Ends (2010), by Jennifer Redfearn & photographer Evan Abramson, follows the daily plight of several pastoral tribes in Kenya and Ethiopia, as they fight for subsistence along the Omo River and Lake Turkana. „For the past 40 years at least, Lake Turkana has steadily



shrunk because of increased evaporation from higher temperatures and a steady reduction in the flow of the Omo due to less rainfall, increased diversion of water for irrigation, and upstream dam projects. As the lake has diminished, it has disappeared altogether from Ethiopian territory and retreated south into Kenya. ...The result has been cross-border raids in which members of both groups kill each other, raid livestock, and torch huts” (Yale Environment 360, 2010). The 16-minute film presents desertification as an underlying catalyst for conflict and political instability in the most vulnerable regions of Africa.

The feature film of the first day, *The Man Who Stopped the Desert* (2010) by Mark Dodd, was also set in Africa and presents an alternative look at desertification. Dodd tells the heroic story of the peasant farmer, Yacouba Sawadogo, who started a movement to fight desertification in the Sahel region of northern Africa by adapting traditional Zai Pit agriculture and different tree planting techniques. Sawadogo’s experimental form of agro-forestry has saved the lives and livelihoods of thousands of farmers in the region. Mixing elements of documentary filmmaking, biography, and historical fiction, Dodd’s film follows the lifelong struggle of an illiterate farmer from his childhood in Burkina Faso, to tribal conflicts within his traditional farming community, to international hearings in the United States on desertification. Especially with regard to desertification it was important for us to offset images of degradation with stories of courage, commitment, and success, such as Dodd’s portrait of Sawadogo.

Agri-cultures – From Plot to Plough

The theme of the second day was *AgriCultures – From Plot to Plough*, which took a detailed look at agricultural politics, practice, and management issues around the world, picking up on many of the ideas presented in the first part of the program. The first part opened with Paare Lorenz’s *The Plow that Broke the Plains*, followed by 2 short films that visualize one of the most challenging threats to modern agriculture in the United States – urban development. *The Corner Plot* (2010), by Ian Cook and Andre Dahmann, pictures the story of 89 year Charlie Koiner, who still grows and sells food despite suburban encroachment outside his home in the D.C. area. *3 Acres in Detroit* (2013) by Nora Mandray and Helene Bienvenu, follows the struggles of two men who take up organic farming in the middle of an abandoned lot in a poor neighborhood in Detroit. Both films feature unusual protagonists in a growing locavore and urban agriculture movement in the United States, motivating audience members to feel empowered to take action on their own, no matter their circumstances or background.

The second part of Tuesday’s program featured a series of short films by activists, artists, and small-scale farmers that focused on the particular, place-based challenges of sustainable agri-



culture worldwide. These included: Patrick Lydon and Suhee Kang's *The Final Straw* (2014), a short documentary project about small-scale farmers in Korea and Japan who use the Fukuoka method of permaculture farming; *Soil is a Diamond* (2011), the story of Christina Kaba of Abalimi Bezekhaya's nurseries - the 'People's Garden Centres' in South Africa by the Green Resistance Group; *Future Farmers' Soil Kitchen* (2011), a documentary about an art project that encouraged urban gardeners to trade soil samples used for basic soil safety testing for soup in an abandoned building in Philadelphia; and two films by Jason Taylor and Chintan Gohil of the Source Project focusing on positive alternatives to the Green Revolution in India, *Agricultural Philosophy* (2011) and *Upendra has Worms* (2011). Two additional video artworks explored the action of composting worms and the growth of vegetable crops as a matter of aesthetics: Justin Rang's *Light&Dark Worms* (2011) and Matthew Moore's *Lifecycles* (2010).

The feature film of the second day and highlight of the program was a special evening screening of *The Symphony of the Soil* (2012, Figure 4) followed by a talk with filmmaker Deborah Koons Garcia and the film's narrator and scientific advisor, Dr. Ignacio Chapela. Amidst an upswell of films with agricultural themes, *Symphony of the Soil* stands out in its mix of science, culture, and history to present a strong case for protecting the delicate lifecycles of healthy soil. During the talk, Koons Garcia spoke about the successful distribution of the film to primary schools, libraries, and even supermarkets to help people connect with the places and people behind their food. Several scientists in the audience expressed opposition to the filmmakers' position on genetically modified foods, but another scientist said he appreciated the critical perspective and wished he had seen *Symphony* when he began his studies, as it presented the complexity of the pedosphere in such a simple and beautiful way.

„Soils Embrace Life and Universe” – From extraction to enlightenment

The final parts of the program reflected the main theme of the congress, „Soils Embrace Life and Universe.” The third day featured a series of films about digging, looking at extraction of the earth's surface materials as an issue of resource exploitation and social justice, but also individual enlightenment and artistic wonder. The feature film of the day, Denis Delestrac's documentary, *Sand Wars* (2013), posited not oil or copper, but sand as one of the most precious and endangered resources that is being mined at an exorbitant pace for major construction projects and urban expansion at the cost of beaches and fragile coastlines worldwide. A series of artists' films picked up on ideas of extraction for more sustainable and creative uses later in the day, including: Joel Tauber's *7 Attempts to Create a Ritual* (2000), a video diary of the artists use of digging as meditation and religious ceremony; Elvira Wersche's *Sand's of the World Qutri* (2008), which documents a multiple-day performance and installation of



Wersche's oversized floor ornaments made out of sifted sands from around the world; Maria Michails' S*OIL (2012), a documentation of a humanly powered hand-car that fuels water transport in a simulated garden; Kasha Guzowska and Nance Klehm's poetic portrayal of natural and artificial soil surfaces, Soil (2012); Jean Marie Offenbacher's documentation of Lillian Ball's Waterwash ABC (2012), an artist's bioremediation project planted on the shores of the Bronx River; and Veronique Maria's documentation of her paintings with collected volcanic materials, Orogeny (2011).

The final day referenced the main theme of the congress with two full-length documentaries, Gene Rosow and Bill Benenson's *Dirt! the Movie* (2010), inspired by Bill Logan's (1995) book of the same name, and *Old Partner* (2008), by I Chunglyeol and Go Yeongjae. These two films were selected based on recommendations from soil scientists before the congress as two films that best captured the sentiments of the congress. Gene Rosow and Bill Benenson's film is a „soil science classic” that has made its way into classrooms, museums, and film festivals alike. Focusing on the beauty and mystery of the hidden ecosystems beneath our feet as well as various threats to the soil, *Dirt!* mixes colorful animations with interviews of prominent experts such as Vandana Shiva, Wangari Maathai, Bill Logan, and Wes Jackson, to weave together an inspiring portrait of the forgotten resource under our feet. According to the congress organizers at the Korean Society of Soil Science and Fertilizer, *Old Partner* is one of the most famous and beloved Korean documentaries that depicts changing relationships to the land represented by pre- and post industrialized farming practices in Korea. The film follows the daily lives of a very old farming couple and their forty-year-old ox, juxtaposed with images of their neighbors' modern farms, tractors, and chemical inputs. The pairing of these films on the last day of the congress elicited the tension between the pace of agricultural and land-use change and the scientific reality that soil formation as well as the fulfillment of our basic needs from the soil is very slow. While *Dirt!* presented a fast-paced survey of soil processes and properties, *Old Partner* depicts the slow moving journey of three individuals through the seasons of their lives on the land.

4. Dirt Dialogues: Conclusions and Outlook

More than an exhibition or film program, *Dirt Dialogues* was a research project in transdisciplinary integration. While specific soil issues provided us with an underlying theoretical framework for inquiry, the actual media and methods of implementation were experimental in form. The scientific poster session served as a site of communication that was logistically, conceptually, and visually well situated for the integration of a broad range of artworks with and about soil, while the makeshift cinema served to deepen aesthetic and emotional experience in an immersive, atypical conference gathering space. With these programs, we aimed



to expand the idea of art as fulfilling merely a social, ceremonial, or decorative function, to include other conference functions of knowledge transfer and idea development. The concept of the exhibition within the conference setting is thus elevated from an „add-on” event to a cultural practice of transdisciplinary exchange. As arts educator and theorist Graeme Sullivan points out, „As a cultural practice, exhibiting is related to the production and display of art... and scholarly inquiry about art, (bringing together) artists, curators, writers, academics, educators, institutions, and communities” (Sullivan 2010: 217). And now also soil scientists.

Although it is difficult to evaluate the impact of the integrated art program on conference guests, praise from leading figures of the soil science community as well as inquiry from organizers of upcoming meetings and world congresses (e.g. SUITMA conference in Mexico City, 21WCSS in Brazil 2018, 22WCSS in Aberdeen 2022, and AGU conference in San Francisco) give us incentive to continue development of such programs in the future. David Lindbo, former president of the Soil Science Society of America (SSSA), Alfred Hartemink, general secretary of the International Union of Soil Scientists (IUSS), and Jae Yang, president of the IUSS commended the inclusion of art in the context of raising soil awareness in their closing comments at the 20WCSS. In almost all keynote speeches, speakers representing international agencies such as the FAO and European Commission called for the integration of „knowledge brokers” and „connectivity specialists” such as social scientists, economists, public relations professionals, and artists, in anchoring soil protection in political and public debate. And the recent framing of a „nexus approach” to soil and land, energy, food, and peace processes at international meetings such as the WCSS and the Global Soil Week marks a turn in transdisciplinary thinking that offers the arts, among other disciplines, an opportunity for supporting soil stewardship and addressing local problems with different methodologies and outcomes.¹ What is still uncertain in both a „nexus approach” to soil protection programs as well as our own plans for future artistic programming are reliable funding structures that support transdisciplinary research and integration.

Finally, conferences are formal settings for open dialogue, sharing of methodological experience and development of ideas. With none of the artists (and only one of the filmmakers) actually present, exchange remained at a textual level; actual dialogue must be facilitated in another way. When I sent out the call for works, many artists and filmmakers expressed an

¹ See the publications of the Water, Energy and Food Security Resource Platform of the German Government for more on the „Nexus” Approach to Soil Governance: http://www.water-energy-food.org/en/knowledge/topics/view__soil.html



interest in „being present” in some way beyond the film or poster contribution and framework of the conference. In response, we are currently working with the Soil Science Society of America to publish a book on the occasion of the upcoming 2015 UN Year of Soils to document many of the works shown in the poster exhibition and film program, as well as dialogues between artists and scientists on particular topics and challenges of soil protection. Rather than an art historical approach, the book follows the internal structure of the divisions and commissions of the International Union of Soil Sciences in its thematic overview. With a section of introductory essays by renowned arts researchers and leading soil scientists and a resource section for classroom and field, the book is oriented at a wide audience of readers to inspire creative conservation and soil communication. The goal of the book is to harvest the momentum of the congress in a way that can be shared and further developed in other formats that will ideally lead to new transdisciplinary networks of creative soil conservation. To join the dialogue, please contact the authors and go to www.soi-larts.org to discover more examples.

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Curriculum Vitae

	Education
2010 to 2014	PhD candidate in the Dept. of Soil Protection, Institute for Ecology, Technische Universität Berlin
2009	Technische Universität Berlin, Dipl. Ing. Landscape Planning
2002	Dutch Art Institute of the Netherlands, Master of Fine Arts
1998	University of Wisconsin-Madison, Bachelor of Arts
	Associations
	German Soil Science Society (DBG), since 2011 Vice Chair, Commission on Soils in Society and Education
	Teaching
WS 2012 – 2013	Part time lecturer for the project seminar series „Wissenschaft Trägt Verantwortung“ at the Leuphana Universität, Lüneburg
WS2010 – 2011	through SS 2011: Part time lecturer for the project „Pedotopia – Resourcing Urban Soils“ at the Institute for Art in Context, Universität der Künste, Berlin
10/2006	through 2014: Part time lecturer in the lecture series „Ecology and Society“ (Ökologie und Gesellschaft), Departments of Soil Science and Soil Protection, TU-Berlin
	Last Exhibitions and Collaborations
06/2014	Dirt Dialogues – An Integrated Art Exhibition, Film Program, and Emerging Dialogue at the 20th WCSS, 20th World Congress of Soil Science, Jeju, Korea
03/2014	Mapping the Urban Grind Mill. Research installation on Soil Sealing in Berlin for the exhibition „Macro-bio logies I“ at the Art Laboratory, Berlin
11/2012	Grounded – A Festival of Films for the First Global Soil Week. Curation of film festival about soil protection issues at Kino Arsenal, Berlin, in collaboration with the IASS Potsdam



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Residencies and Grants

Andrea von Braun Stiftung, six month interdisciplinary research grant	07/2013 – 12/2013
DFG Graduate Research Fellowship, 780/3 Perspectives on Urban Ecology III – Optimizing urban nature development	09/2009 – 03/2013
MOTA Museum of Transitory Art. Wish Garden – Flooded Harvest, Ljubljana, Slovenia	09/2010
Wriezener Bahnhof Freiraumlabor (Wriezener Park Open Space Lab). Berlin, Germany	09/2006 – 12/2009
TARP – Taliesin Artist Residency Program Frank Lloyd Wright School of Architecture - Taliesin West, Scottsdale, Arizona, USA	02–03/2008